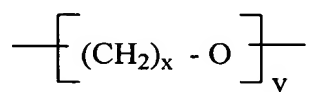


What is claimed is:

1. A thermoplastic polyurethane polymer comprising:  
a polyether polyurethane derived from at least one polyisocyanate reacted with at least one hydroxyl terminated aromatic glycol chain extender and at least one hydroxyl terminated polyether intermediate containing an alkylene oxide having the formula



wherein x is an integer from 1 to 10 and y is an integer from 11 to 115.

2. A thermoplastic polyurethane polymer of claim 1 wherein said hydroxyl terminated polyether intermediate is polyethylene glycol.

3. A thermoplastic polyurethane polymer of claim 2 wherein said polyethylene glycol has a number average molecular weight of from about 1,000 to about 2,000.

4. A thermoplastic polyurethane polymer of claim 1 wherein said hydroxyl terminated aromatic glycol is hydroquinone bis (2-hydroxyethyl) ether.

5. A thermoplastic polyurethane polymer of claim 1 wherein said polyisocyanate is a diisocyanate.

6. A thermoplastic polyurethane polymer of claim 5 wherein said diisocyanate is methylene bis diphenyl diisocyanate.

7. A thermoplastic polyurethane polymer of claim 1 wherein x is an integer from 2 to 6 and y is an integer from 20 to 80.

8. A thermoplastic polyurethane polymer of claim 7 wherein x is 2 and y is an integer from 28 to 38.

9. A thermoplastic polyurethane polymer of claim 1 having a moisture vapor transmission value greater than about  $4500 \text{ g/m}^2 \text{ day}$ , as measured on a 1.0 mil thick sample.

10. A thermoplastic polyurethane polymer of claim 9 having a moisture vapor transmission value greater than about  $5500 \text{ g/m}^2 \text{ day}$ , as measured on a 1.0 mil thick sample.

11. A thermoplastic polyurethane polymer of claim 1 having a surface resistivity of less than about  $1.0 \times 10^{11} \text{ ohms/square}$  as measured according to ASTM D-257.

12. A thermoplastic polyurethane polymer of claim 11 having a surface resistivity of less than about  $3.0 \times 10^{10} \text{ ohms/square}$  as measured according to ASTM D-257.

13. A thermoplastic polyurethane polymer of claim 1 wherein said hydroxyl terminated polyether intermediate has a number average molecular weight of from about 350 to about 10,000.

14. A thermoplastic polyurethane polymer of claim 13 wherein said hydroxyl terminated polyether intermediate has a number average molecular weight of from about 500 to about 5,000.

15. A thermoplastic polyurethane polymer of claim 14 wherein said hydroxyl terminated polyether intermediate has a number average molecular weight of from about 700 to about 3,000.

16. A thermoplastic polyurethane polymer of claim 15 wherein said hydroxyl terminated polyether intermediate has a number average molecular weight of from about 1,000 to about 2,000.

17. A thermoplastic polyurethane polymer of claim 1 having a melting point of from about 150°C to about 220°C as determined according to ASTM D-3417-99.

18. A thermoplastic polyurethane polymer of claim 17 having a melting point of from about 160°C to about 200°C as determined according to ASTM D-3417-99.

19. A thermoplastic polyurethane polymer of claim 18 having a melting point of from about 165°C to about 180°C as determined according to ASTM D-3417-99.

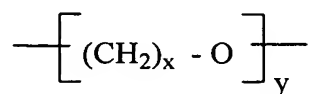
20. A thermoplastic polyurethane polymer of claim 1 wherein the amount of said aromatic glycol chain extender is from about 1.0 to about 2.0 moles per mole of said hydroxyl terminated polyether intermediate.

21. A thermoplastic polyurethane polymer of claim 20 wherein the amount of said aromatic glycol chain extender is from about 1.2 to about 1.8 moles per mole of said hydroxyl terminated polyether intermediate.

22. A thermoplastic polyurethane polymer of claim 1 wherein said hydroxyl terminated polyether intermediate is polyethylene glycol having a number average molecular weight of from about 1,000 to about 2,000, said polyisocyanate is methylene bis diphenyl diisocyanate, said aromatic glycol chain extender is hydroquinone bis (2-hydroxyethyl) ether, and wherein said polyurethane polymer has a moisture vapor transmission rate of greater than about 5500 g/m<sup>2</sup> day as measured on a 1.0 mil thick sample and a melting point of from about 165°C to about 180°C as measured according to ASTM D-3417-99.

23. A process for producing a thermoplastic polyurethane polymer comprising the steps of:

mixing and reacting at least one polyisocyanate, at least one hydroxyl terminated aromatic glycol chain extender and at least one hydroxyl terminated polyether intermediate, wherein said polyether intermediate contains an alkylene oxide having the formula



wherein x is an integer from 1 to 10 and y is an integer from 11 to 115.

24. A process of claim 23 wherein the mole ratio of said chain extender to said polyether intermediate is from about 1.0 to about 2.0 moles of chain extender per mole of said polyether intermediate.

25. A process of claim 24 wherein the mole ratio of said polyisocyanate to the total moles of said polyether intermediate and said aromatic chain extender is from about 0.98 to about 1.03 moles of polyisocyanate per mole of polyether intermediate and aromatic chain extender.

26. A process of claim 25 wherein said hydroxyl terminated polyether intermediate is polyethylene glycol.

27. A process of claim 25 wherein said aromatic glycol chain extender is hydroquinone bis (2-hydroxyethyl).

28. A process of claim 25 wherein said polyisocyanate is a diisocyanate.

29. A process of claim 28 wherein said diisocyanate is methylene bis diphenyl diisocyanate.

30. A process of claim 23 wherein x is an integer from 2 to 6 and y is an integer from 20 to 80.

31. A process of claim 30 wherein x is 2 and y is an integer from 28 to 38.

32. A process of claim 23 wherein said hydroxyl terminated polyether intermediate has a number average molecular weight of from about 350 to about 10,000.

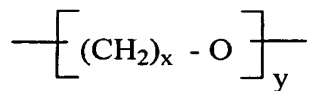
33. A process of claim 32 wherein said hydroxyl terminated polyether intermediate has a number average molecular weight of from about 700 to about 3,000.

34. A process of claim 33 wherein said hydroxyl terminated polyether intermediate has a number average molecular weight of from about 1,000 to about 2,000.

35. A process of claim 23 wherein said reaction is performed in an extruder for a reaction time of from about 2 minutes to about 10 minutes at a temperature of from about 100°C to about 220°C.

36. A process of claim 35 wherein said reaction time is from about 3 minutes to about 5 minutes.

37. A breathable article comprising: (a) at least one layer of fabric and (b) at least one layer of thermoplastic polyurethane polymer, wherein said polyurethane polymer is a polyether polyurethane derived from at least one polyisocyanate reacted with at least one hydroxyl terminated aromatic glycol chain extender and at least one hydroxyl terminated polyether intermediate containing an alkylene oxide having the formula



wherein x is an integer from 1 to 10 and y is an integer from 11 to 115.

38. An article of claim 37 wherein said at least one layer of fabric comprises a non-woven fabric.

39. An article of claim 37 wherein said at least one layer of fabric comprises a woven fabric.

40. An article of claim 37 wherein said article comprises at least one layer of fluoro polymer in addition to said at least one layer of fabric and at least one layer of thermoplastic polyurethane polymer.

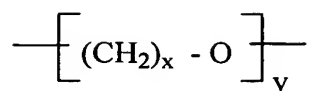
41. An article of claim 40 wherein said article is an article of clothing.

42. An article of claim 37 wherein said article is house wrap.

43. An article of claim 37 wherein said article is an article of roofing membrane.

44. An article of claim 37 wherein said hydroxyl terminated polyether intermediate is polyethylene glycol having a number average molecular weight of from about 1,000 to about 2,000, said polyisocyanate is methylene bis diphenyl diisocyanate, said aromatic glycol chain extender is hydroquinone bis (2-hydroxyethyl) ether, and wherein said polyurethane polymer has a moisture vapor transmission rate of greater than about 5500 g/m<sup>2</sup> day as measured on a 1.0 mil thick sample and a melting point of from about 165°C to about 180°C as measured according to ASTM D-3417-99.

45. A melt spun fiber comprising a thermoplastic polyurethane polymer, wherein said polyurethane polymer is a polyether polyurethane derived from at least one polyisocyanate reacted with at least one hydroxyl terminated aromatic glycol chain extender and at least one hydroxyl terminated polyether intermediate containing an alkylene oxide having the formula



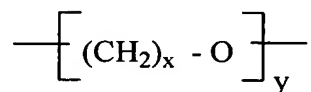
wherein x is an integer from 1 to 10 and y is an integer from 11 to 115.

46. A melt spun fiber of claim 45 comprising an additive to cross link said polyurethane polymer.

47. A melt spun fiber of claim 46 wherein said additive to cross link said polyurethane polymer is a diphenyl methane diisocyanate-terminated polyether prepolymer, wherein said prepolymer is derived from poly(tetramethylene ether) glycol reacted with methylene bis diphenyl diisocyanate.

48. A melt spun fiber of claim 47 wherein the level of said additive used is from about 5 weight percent to about 20 weight percent of the said fiber.

49. A clothing garment comprising melt spun fibers, said fibers are thermoplastic polyurethane polymer fibers derived from at least one polyisocyanate reacted with at least one hydroxyl terminated aromatic glycol chain extender and at least one hydroxyl terminated polyether intermediate containing an alkylene oxide having the formula



wherein x is an integer from 1 to 10 and y is an integer from 11 to 115.

50. A clothing garment of claim 49 comprising polyester fibers woven together with said melt spun thermoplastic polyurethane polymer fibers.

51. A clothing garment of claim 50 wherein said hydroxyl terminated polyether intermediate is polyethylene glycol, said polyisocyanate is methylene bis diphenyl diisocyanate, said aromatic glycol chain extender is hydroquinone bis (2-hydroxyethyl) ether, and wherein said polyurethane polymer has a moisture vapor transmission rate of greater than about 5500 g/m<sup>2</sup> day as measured on a 1.0 mil thick sample and a melting point of from about 165°C to about 180°C as measured according to ASTM D-3417-99.